1. A method of patterning a surface, comprising:

providing a stamp having a stamping surface;

disposing a substrate proximate to the stamping surface;

modulating the dimensions of the stamp to place the stamping surface in contact with the substrate.

2. The method of claim 1, further comprising modulating the dimensions of the stamp before the step of disposing the substrate.

3. The method of claim 1, further comprising, after the step of modulating the dimensions of the stamp to place the stamping surface in contact with the substrate, modulating the dimensions of the stamp to facilitate removal of the stamping surface from the substrate.

4. The method of claim 1, wherein the step of modulating the dimensions comprises a member of the group consisting of applying a mechanical stress, applying an electrical stimulus, removing a mechanical stress, removing an electrical stimulus, creating a partial vacuum, venting a vacuum, applying a magnetic field, removing a magnetic field, and any combination of the above.

5. The method of claim 4, wherein the mechanical stress comprises a positive hoop stress, a negative hoop stress, or a hydrostatic stress.

6. The method of claim 1, wherein the entirety of the stamp is modulated at the same time.

7. The method of claim 1, wherein at least one of the stamping surface and a surface of the substrate exhibits convexity in at least one dimension, and said convexity does not result from a surface texture or pattern.

8. The method of claim 1, further comprising exposing the substrate to electromagnetic radiation by transmitting said radiation through the stamp, wherein a portion of the stamp is opaque to said radiation.

9. The method of claim 1, further comprising disposing a transferable material on the stamping surface, wherein, when the stamp is in contact with the substrate, the transferable material is transferred to the substrate in a pattern corresponding to the pattern on the stamping surface.

10. The method of claim 9, wherein the transferable material comprises a member of the group consisting of a self-assembled monolayer forming molecule, a protein, an amino acid sequence, a synthetic peptide, a simple carbohydrate, a nucleic acid sequence, a lipid, a complex carbohydrate, an organic molecule, a polymer precursor, an inorganic molecule, an organometallic complex, a metal, a metallic species in a solvent, a metal colloid in a solvent, biological particles suspended in a carrier, and non-biological particles suspended in a carrier, an electroless plating precursor, and any combination of the above.

11. The method of claim 1, wherein the stamping surface comprises a pattern comprising at least one channel defined by raised portions on the surface of the stamp.

12. The method of claim 11, wherein a cross section of the stamp includes two raised portions, and wherein an angular distance between the two raised portions is between 0° and 180°.

13. The method of claim 11, wherein a lateral dimension of a channel or a raised portion is 100 nm or greater.

14. The method of claim 11, further comprising:

placing the channel in fluidic communication with a fluid source; and

causing a fluid to flow from the fluid source through a path bounded by the raised portions and the substrate.

15. The method of claim 14, wherein the fluid comprises a member of the group consisting of an etchant, a polymer precursor, a sol-gel fluid, a metal colloid in a solvent, cells suspended in a medium, a metallic species in a solvent, a metal, an electroplating solution, an electroless plating solution, a reactive gas, and any combination of the above.

16. The method of claim 14, wherein the fluid comprises a solution comprising a member of the group consisting of a self-assembled monolayer forming molecule, a protein, an amino acid sequence, a synthetic peptide, a simple carbohydrate, a nucleic acid sequence, a lipid, a complex carbohydrate, an organic molecule, a polymer precursor, an inorganic molecule, an electroless plating precursor, an organometallic complex, a metallic species, cells in a medium, and any combination of the above.

17. The method of claim 14, further comprising adjusting the temperature of the fluid while it is in the channel.

18. The method of claim 14, further comprising exposing the fluid in the channel to an electric current, a magnetic field, or electromagnetic radiation.

19. The method of claim 14, further comprising exposing the fluid to ultraviolet light.

20. The method of claim 14, further comprising adjusting the temperature of the substrate while the fluid is in the channel.

21. The method of claim 14, wherein a lateral dimension of a channel or raised portion is 200 nm or greater.

22. The method of claim 14, further comprising disposing a material on the substrate before the step of causing, wherein a component of the fluid interacts with the material when it is disposed in the channel.

23. The method of claim 14, wherein the fluid comprises a carrier and a material dissolved or suspended in the carrier, wherein the method further comprises allowing the carrier to dissipate and the material to harden.

24. The method of claim 11, further comprising wetting the stamping surface with a fluid, wherein, when the stamping surface is in contact with the area to be patterned, an interaction of the substrate with the fluid causes the substrate to develop a surface texture in a pattern conforming to the stamping surface of the stamp.

25. The method of claim 24, wherein the fluid dissolves or swells the substrate.

26. The method of claim 24, wherein the substrate comprises a polymer.

27. The method of claim 1, further comprising:

removing the stamp from the substrate; and

placing at least a portion of a second stamp against the substrate.

28. The method of claim 27, further comprising, before the placing step of claim 27, disposing the substrate in a specific position with respect to the second stamp.

29. The method of claim 28, wherein the step of disposing comprises positioning the substrate with a micrometer stage, optically setting a mark on the substrate with respect to the stamp, or aligning a mark on the substrate with a laser.

30. The method of claim 1, wherein the substrate comprises a metallic material, a semiconductor material, a ceramic, or a polymer.

31. The method of claim 30, wherein the substrate comprises a coating comprising a metallic material, a semiconductor material, a ceramic, a glass, or a polymer.

32. The method of claim 1, further comprising disposing a material on the substrate before the step of placing.

33. The method of claim 1, wherein the stamp comprises a lumen having a portal providing communication between the lumen and an exterior of the stamp.

34. The method of claim 33, wherein walls of the stamp defining the lumen are characterized by flat, curved, or a combination of both.

35. The method of claim 33, wherein the stamp comprises a tube or balloon.

36. The method of claim 33, wherein the stamp has a diameter of at least 100 micrometers.

37. The method of claim 1, wherein the stamp and the substrate have the same or different shapes.

38. The method of claim 37, wherein the stamp is adapted and constructed to contact a substrate having a surface selected from open, partially closed, and closed.

39. A method of patterning a surface, comprising:

providing an elastomeric stamp having a textured surface;

placing at least a portion of the stamp against a substrate having an area to be patterned, wherein

the entire area to be patterned by the stamp is in contact with the textured surface when the stamp is placed against the substrate,

at least one of the textured surface and a surface of the substrate exhibits convexity in at least one dimension, and

said convexity does not result from a surface texture or pattern.

40. The method of claim 39, further comprising disposing a transferable material on the textured surface, wherein, when the stamp is in contact with the substrate, the transferable material is transferred to the substrate in a pattern corresponding to a pattern defined by the textured surface.

41. The method of claim 40, wherein the transferable material comprises a member of the group consisting of a self-assembled monolayer forming molecule, a protein, an amino acid sequence, a synthetic peptide, a simple carbohydrate, a nucleic acid sequence, a lipid, a complex carbohydrate, an organic molecule, a polymer precursor, an inorganic molecule, an organometallic complex, a metal, a metallic species in a solvent, a metal colloid in a solvent, biological particles suspended in a carrier, and non-biological particles suspended in a carrier, an electroless plating precursor, and any combination of the above.

42. The method of claim 39, wherein the texture comprises at least one channel defined by raised portions on the textured surface of the elastomeric stamp.

43. The method of claim 42, wherein a lateral dimension of a channel or a raised portion is 100 nm or greater.

44. The method of claim 42, further comprising:

placing the channel in fluidic communication with a fluid source; and

causing a fluid to flow from the fluid source into the channel along a surface of the substrate.

45. The method of claim 44, wherein the fluid comprises a member of the group consisting of an etching solution, a polymer precursor, a sol-gel fluid, a metal colloid in a solvent, cells suspended in a medium, a metallic species in a solvent, a metal, an electroplating solution, an electroless plating solution, a reactive gas, and any combination of the above.

46. The method of claim 44, wherein the fluid comprises a solution comprising a member of the group consisting of a self-assembled monolayer forming molecule, a protein, an amino acid sequence, a synthetic peptide, a simple carbohydrate, a nucleic acid sequence, a lipid, a complex carbohydrate, an organic molecule, a polymer precursor, an inorganic molecule, an electroless plating precursor, an organometallic complex, a metallic species, cells in a medium, and any combination of the above.

47. The method of claim 44, further comprising adjusting the temperature of the fluid while it is in the channel.

48. The method of claim 44, further comprising exposing the fluid in the channel to an electric current, a magnetic field, or electromagnetic radiation.

49. The method of claim 44, further comprising exposing the fluid in the channel to ultraviolet light.

50. The method of claim 44, further comprising adjusting the temperature of the substrate while the fluid is in the channel.

51. The method of claim 44, wherein a lateral dimension of a channel or raised portion is 200 nm or greater.

52. The method of claim 44, further comprising disposing a material on the substrate before the step of causing, wherein a component of the fluid interacts with the material when it is disposed in the channel.

53. The method of claim 44, wherein the fluid comprises a carrier and a material dissolved or suspended in the carrier, wherein the method further comprises allowing the carrier to dissipate and the material to harden.

54. The method of claim 39, further comprising wetting the textured surface with a fluid, wherein, when the textured surface is in contact with the area to be patterned, an interaction of the substrate with the fluid causes the substrate to develop a surface texture in a pattern conforming to the textured surface of the stamp.

55. The method of claim 54, wherein the fluid dissolves or swells the substrate.

56. The method of claim 54, wherein the substrate comprises a polymer.

57. The method of claim 39, further comprising:

removing the stamp from the substrate; and

placing at least a portion of a second stamp against the substrate.

58. The method of claim 57, further comprising, before the placing step of claim 58, disposing the substrate in a specific position with respect to the second stamp.

59. The method of claim 58, wherein the step of disposing comprises positioning the substrate with a micrometer stage, optically setting a mark on the substrate with respect to the stamp, or aligning a mark on the substrate with a laser.

60. The method of claim 39, wherein the substrate comprises a metallic material, a semiconductor material, a ceramic, a glass, a polymer, or a composite of a plurality of any of the above.

61. The method of claim 39, wherein the substrate comprises a coating comprising a metallic material, a semiconductor material, a ceramic, a glass, a polymer, or a composite of a plurality of any of the above.

62. The method of claim 39, wherein the substrate and the stamp have the same or different shapes.

63. The method of claim 39, further comprising disposing a material on the substrate before the step of placing.

64. The method of claim 39, wherein the stamp comprises a lumen having a portal providing communication between the lumen and an exterior of the stamp.

65. The method of claim 64, wherein walls of the stamp defining the lumen are characterized by flat, curved, or a combination of both.

66. The method of claim 64 wherein the stamp comprises one or two portals.

67. The method of claim 64 wherein the stamp is adapted and constructed to pattern a substrate having a shape selected from the group consisting of at least partially closed, open, multiplanar, and non-planar.

68. The method of claim 64 wherein a cross section of the stamp includes two raised portions, and wherein an angular distance between the two raised portions is between 0° and 180°.

69. The method of claim 64 wherein the stamp has an inner diameter of at least 100 micrometers.

70. The method of claim 39, further comprising exposing the substrate to electromagnetic radiation by transmitting said radiation through the stamp, wherein the texture comprises regions opaque to said radiation.

71. A deformable stamp having a textured surface,

wherein the stamp is arranged and constructed to adopt at least two conformations, wherein

in the first conformation, a substrate can be placed proximate to the stamp, and

in the second conformation, a textured surface on the stamp is in contact with the substrate.

72. The stamp of claim 71, wherein the stamp comprises an elastomer.

73. The stamp of claim 72, wherein the stamp comprises a member of poly(dimethylsiloxane), poly(butadiene), poly (acrylamide), poly(butylstyrene), a chlorosilane polymer, an epoxy polymer, a diglycidyl ether of bisphenol A, a polymer having an aminated aromatic backbone, a polymer having a triazine backbone, a polymer having a cycloaliphatic backbone, a co- or block-polymer of any of the above, and any combination of the above.

74. The method of claim 71, wherein the textured surface comprises at least one channel defined by a raised portion of the stamp.

75. The stamp of claim 74, wherein the at least one channel and the raised portions each define a pattern characterized by a member of continuous, discontinuous, or a combination of both.

76. The method of claim 74, wherein a lateral dimension of a channel or a raised portion is 100 nm or greater.

77. The stamp of claim 71, wherein the stamp exhibits convexity in at least one dimension, and said convexity does not result from a surface texture or pattern.

78. The stamp of claim 71, wherein the stamp comprises a lumen having a portal providing communication between the lumen and an exterior of the stamp.

79. The stamp of claim 78, wherein walls of the stamp defining the lumen are characterized by flat, curved, or a combination of both.

80. The stamp of claim 78, wherein the stamp comprises one or two portals.

81. The method of claim 78, wherein a cross section of the stamp includes two raised portions, and wherein an angular distance between the two raised portions is between 0° and 180°.

82. The method of claim 78, wherein the lumen has a diameter of at least 100 □m.

83. The stamp of claim 71, further comprising an interior and an exterior surface, wherein the exterior surface comprises the textured surface, the interior surface comprises the textured surface, or both of the above.

84. The stamp of claim 71, wherein the substrate and the stamp have the same or different shapes.

85. The stamp of claim 71, wherein the stamp is adapted and constructed to conform to a substrate having a shape selected from the group consisting of at least partially closed, open, multiplanar, and non-planar.

86. A method of inking a stamp, comprising:

providing a re-inker having a surface; and

placing the surface of first and second portions of the re-inker in contact with a stamping surface of the stamp,

wherein the step of placing comprises modulating the dimensions of the stamping surface of the stamp or contacting a portion of the stamping surface with the re-inker and a substrate to be patterned by the stamp simultaneously.

87. The method of claim 86, wherein the re-inker has a first and a second surface, and wherein the first and second surfaces are not in fluidic communication.

88. The method of claim 86, wherein the re-inker in incorporated into a substrate to be patterned by the stamp.

89. The method of claim 86, wherein the re-inker is fabricated from a molecular gel.

90. The method of claim 86, wherein the stamping surface of the stamp is an interior or an exterior surface of the stamp.

91. The method of claim 86, further comprising disposing the re-inker between the stamp and a substrate before the step of placing.

92. The method of claim 86, further comprising, before the step of placing:

separating first and second portions of the re-inker along a seam; and disposing the first and second portions of the re-inker between the stamp and a substrate.

93. A method of releasing a molded polymer from a master, comprising,

swelling the polymer with a solvent; and

sliding or disengaging the polymer from the master,

wherein the molded polymer has a partially closed surface.

94. The method of claim 93, wherein the polymer has a relief pattern molded into at least one surface.

95. The method of 93, wherein the polymer comprises an elastomer.

96. The method of claim 93, wherein the solvent comprises a member of the group consisting of dichloromethane, toluene, tetrahydrofuran, benzene, chloroform, and carbon tetrachloride.

97. The method of claim 93, further comprising inverting the stamp.

98. A method of continuously stamping a substrate, comprising:

providing a stamp having an at least partially closed surface;

placing the stamp in contact with a substrate; and

causing relative advancement of the substrate with respect to the stamp, wherein:

the stamp revolves about an axis parallel to a surface of the substrate,

the stamp has a pattern defined by raised portions on a surface that contacts the substrate, and

an ink is transferred from the stamp to the substrate where the substrate comes in contact with the raised portions.

99. The method of claim 98, wherein the pattern defined by the raised portions is continuous with respect to a circumference of the stamp.

100. The method of claim 98, further comprising re-inking the stamp.

101. The method of claim 100, wherein re-inking comprises:

placing a reservoir of ink in fluidic contact with the stamp,

wherein the stamp is re-inked as it revolves.

102. The method of claim 101, further comprising choosing a speed of stamp revolution such that a re-inked portion of the stamp will dry before the re-inked portion of the stamp contacts the substrate.

103. The method of 101, further comprising drying a re-inked portion of the stamp before the re-inked portion contacts the substrate.

104. An apparatus for patterning a substrate, comprising

a chamber having first and second ends, wherein the chamber is in fluidic communication with a vacuum source;

first and second caps sealably affixed to the first and second ends of the chamber;

first and second rigid tubes sealably attached to the first and second ends, wherein the first and second tubes provide a conduit from an exterior of the apparatus to an interior of the apparatus; and

a stamp having first and second ends sealably attached to an interior end of each of the first and second rigid tubes, wherein a lumen of the stamp is in fluidic communication with the exterior of the chamber.

105. The apparatus of claim 104, wherein at least one of the seals is effected by an o-ring or gasket.

106. The apparatus of claim 104, wherein at least one of the seals is effected by a threaded fitting.

107. The apparatus of claim 104, wherein the chamber comprises two portions that are sealably connected.

108. The apparatus of claim 104, wherein at least one of the caps is removable.

109. The apparatus of claim 104, wherein at least one of the rigid tubes is removable.

110. A photomask, comprising:

a deformable stamp according to claim 71, wherein the stamp is at least translucent, and wherein the textured surface comprises interspersed opaque and at least translucent regions.

111. The mask of claim 110, wherein the stamp comprises an interior and an exterior surface, and wherein the textured surface comprises the interior or the exterior surface.

112. The mask of claim 110, wherein the opaque regions are metallized.

113. The mask of claim 110, wherein the texture comprises at least one channel defined by raised portions on the textured surface of the mask, and wherein the

opaque regions comprise an end surface of the raised portions or walls of the channel.

114. The mask of claim 110, wherein the texture comprises the interspersed opaque and at least translucent regions.

115. The mask of claim 110, wherein the stamp comprises a transparent material.